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Tree Farm Licence 10

Issued to International Forest Products Limited

Rationale for Allowable Annual Cut (AAC) Determination

Effective September 13, 2001

Ken Baker
Deputy Chief Forester

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Objective of this Document

This document is intended to provide an accounting of the factors I have considered and the rationale I have employed in making my determination, under Section 8 of the *Forest Act*, of the allowable annual cut (AAC) for Tree Farm Licence (TFL) 10. This document also identifies where new or better information is needed for incorporation in future determinations.

Description of the TFL

TFL 10 is located about 150 kilometres north-west of Vancouver on the mainland coast. The TFL surrounds Toba Inlet and encompasses all the watersheds that flow into the upper reaches of Toba Inlet, except the Klite River drainage (i.e., the Tahumming, Brem, Nor, and Toba watersheds). The TFL is held by International Forest Products Ltd. (the licensee) and is administered from the British Columbia Forest Service (BCFS) Sunshine Coast Forest District Office in Powell River, within the Vancouver Forest Region.

The TFL area is characterized by rugged topography with steep mountainous terrain, deep river valleys, and marine coastline along Toba Inlet. The majority of the operable forest lies within the Coastal Western Hemlock biogeoclimatic zone, with a smaller portion in the higher elevation Mountain Hemlock biogeoclimatic zone.

The total land base of TFL 10 is 229 677 hectares, of which 53 723 hectares (23 percent) are covered by productive forest. The other 175 954 hectares (77 percent) are composed largely of alpine tundra, icefields, rock, lakes, and swamp. In the base case, 23 582 hectares (44 percent) of the total productive land base were estimated to contribute to the long-term timber harvesting land base. Therefore, slightly less than 10 percent of the total TFL 10 area contributes to the timber harvesting land base assumed in the analysis.

History of the AAC

In 1951, the AAC for TFL 10 (then known as Forest Management Licence 10) was 30 667 cubic metres. The AAC was increased in 1954 to 53 802 cubic metres due to an increase in area for the TFL.

Through a series of increases the AAC rose to 219 000 cubic metres by 1989, reflecting improved utilization standards, updated inventory information, and an expanded total land base.

The AAC was reduced to 170 950 cubic metres in 1989, and has remained at that level ever since. The current AAC, which includes a partition to the Toba River portion of the TFL (see Partitioned component of the harvest), was determined December 11, 1996.

New AAC determination

Effective September 13, 2001, the new AAC for TFL 10 will be 170 950 cubic metres. Of this total, 55 000 cubic metres per year is partitioned to the Toba Inlet portion of the TFL and 115 950 cubic metres is partitioned to the Toba River portion of the TFL.

This AAC will remain in effect until a new AAC is determined, which must take place within five years of this determination.

Information sources used in the AAC determination

Information considered in determining the AAC for TFL 10 include the following:

- *Statement of Management Objectives, Options and Procedures (SMOOP) for Management Plan (MP) No. 8,* Tree Farm Licence 10, accepted May 6, 1999;
- *Information Package*: *Tree Farm Licence 10*, Management Plan No. 8, International Forest Products Limited, accepted May 23, 2000;
- Existing stand yield tables for TFL 10, accepted by BCFS Resources Inventory Branch, June 9, 2000;
- Managed stand yield tables and site index curves, accepted by BCFS Research Branch, June, 2000;
- *Timber Supply Analysis: Tree Farm Licence 10*, Management Plan No. 8 International Forest Products Limited, accepted March 6, 2001;
- *Proposed Management Plan No. 8: TFL 10*, International Forest Products Limited, submitted July 19, 2001;
- *TFL 10, Twenty-Year Plan*, International Forest Products Limited, accepted August 7, 2001;
- Memorandum from the Director of Timber Supply Branch of the Ministry of Forests, dated December 1, 1997, entitled *Incorporating Biodiversity and Landscape Units in the Timber Supply Review*;
- *Identified Wildlife Management Strategy*, February 1999;
- Landscape Unit Planning Guide, BCFS and MELP, March 1999;
- Higher Level Plans: Policy and Procedures, BCFS and MELP, December, 1996;
- *Forest Practices Code of British Columbia Act* (Forest Practices Code), consolidated to March 2001;
- *Forest Practices Code of British Columbia Act Regulations and Amendments*, current as of March 2001;
- *Forest Practices Code of British Columbia Guidebooks*, BCFS and MELP, BCFS and MELP;
- Letter from the Minister of Forests to the Chief Forester, dated July 28, 1994, stating the Crown's economic and social objectives;

- Memorandum from the Minister of Forests to the Chief Forester, dated February 26, 1996, stating the Crown's economic and social objectives with regard to visual resources;
- Technical review and evaluation of current operating conditions on TFL 10 through comprehensive discussions with BCFS and MELP staff, notably at the AAC determination meeting held in Victoria on December 14, 2000.

Role and limitations of the technical information used

Section 8 of the *Forest Act* requires the chief forester to consider biophysical as well as social and economic information in AAC determinations. A timber supply analysis, and the inventory and growth and yield data used as inputs to the analysis, typically form the major body of technical information used in AAC determinations. Timber supply analyses and associated inventory information are concerned primarily with biophysical factors—such as the rate of timber growth and definition of the land base considered available for timber harvesting—and with management practices.

However, the analytical techniques used to assess timber supply are necessarily simplifications of the real world. There is uncertainty about many of the factors used as inputs to timber supply analysis due in part to variations in physical, biological, and social conditions, although ongoing science-based improvements in the understanding of ecological dynamics will help reduce some of this uncertainty.

Furthermore, technical analytical methods such as computer models cannot incorporate all of the social, cultural, and economic factors that are relevant when making forest management decisions. Therefore, technical information and analysis do not necessarily provide complete answers or solutions to forest management problems such as AAC determinations. The information does, however, provide valuable insight into potential impacts of different resource-use assumptions and actions, and thus forms an important component of the information required to be considered in AAC determinations.

In determining the AAC for TFL 10, I have considered known limitations of the technical information provided, and I am satisfied that the information provides a suitable basis for my determination.

Statutory framework

Section 8 of the *Forest Act* requires the chief forester to consider particular factors in determining AACs for TSAs and TFLs. Section 8 is reproduced in full as Appendix 1.

In accordance with Section 23(3) of the *Interpretation Act*, the deputy chief forester is expressly authorized to carry out the functions of the chief forester, which include those required under Section 8 of the *Forest Act*.

The chief forester has expressed the importance of consistency of judgment in making AAC determinations. I also recognize the need for consistency of approach. I have observed the chief forester during a number of previous AAC determinations and am familiar with the guiding principles that the chief forester has employed in making AAC

determinations. I find these principles to be reasonable and appropriate and I have adopted them as described below in making my AAC determination for TFL 10.

Guiding principles for AAC determinations

Rapid changes in social values and in our understanding and management of complex forest ecosystems mean that there is always some uncertainty in the information used in AAC determinations. When a large number of determinations are made for many forest management units over extended periods of time, administrative fairness requires a reasonable degree of consistency of approach in incorporating these changes and uncertainty. To make his approach in these matters explicit, the chief forester has compiled a set of guiding principles for AAC determinations. I have reviewed these principles and find them to be reasonable, and thus I have adopted and applied them as deputy chief forester in AAC determinations for TFLs. These principles are set out below. If in some specific circumstance it may be necessary to deviate from these principles, I will provide a detailed reasoning in the considerations that follow.

Two important ways of dealing with uncertainty are:

(i) minimizing risk, in respect of which in making AAC determinations, I consider the uncertainty associated with the information before me, and attempt to assess the various potential current and future social, economic and environmental risks associated with a range of possible AACs; and

(ii) redetermining AACs frequently, to ensure they incorporate current information and knowledge, a principle that has been recognized in the legislated requirement to redetermine AACs every five years. The adoption of this principle is central to many of the guiding principles that follow.

In considering the various factors that Section 8 of the *Forest Act* requires the chief forester to take into account in determining AACs, I attempt to reflect as closely as possible operability and forest management factors that are a reasonable extrapolation of current practices. It is not appropriate to base my decision on unsupported speculation with respect either to factors that could work to increase the timber supply—such as optimistic assumptions about harvesting in unconventional areas, or using unconventional technology, that are not substantiated by demonstrated performance—or to factors that could work to reduce the timber supply, such as integrated resource management objectives beyond those articulated in current planning guidelines or the *Forest Practices Code of British Columbia Act* and its associated regulations (the Forest Practices Code).

The *Forest Practices Code of British Columbia Regulations* were approved by the Lieutenant Governor in Council on April 12, 1995, and released to the public at that time. The *Forest Practices Code of British Columbia Act* was brought into force on June 15, 1995.

Although implementation of the Forest Practices Code has been underway since the end of the transition period on June 15, 1997, the timber supply implications of some of its provisions, such as those for landscape-level biodiversity, still remain uncertain,

particularly when considered in combination with other factors. In each AAC determination the chief forester takes this uncertainty into account to the extent possible in the context of the best available information. In making my determination for TFL 10, as deputy chief forester, I have followed the same approach.

As British Columbia progresses toward completion of strategic land use plans, the eventual timber supply impacts associated with the land-use decisions resulting from the various planning processes—including the Commission on Resources and Environment (CORE) process for regional plans, the Protected Areas Strategy (PAS) and the Land and Resource Management Planning (LRMP) process—are often discussed in relation to current AAC determinations. Since the outcomes of these planning processes are subject to significant uncertainty before formal approval by government, it has been and continues to be the position of the chief forester that in determining AACs it would be inappropriate to attempt to speculate on the timber supply impacts that will eventually result from land-use decisions that have not yet been taken by government. I consider this approach to be reasonable and appropriate. Like the chief forester, therefore, I will not take into account the possible impacts of existing or anticipated recommendations made by such planning processes, nor attempt to anticipate any action the government could take in response to such recommendations.

Moreover, even where government has made a formal land-use decision, it may not always be possible to fully analyze and account for the consequent timber supply impact in a current AAC determination. In many cases, government's land-use decision must be followed by a number of detailed implementation decisions. For example, a land-use decision may require the establishment of resource management zones and resource management objectives and strategies for these zones. Until such implementation decisions are made it would be impossible to fully assess the overall impacts of the land-use decision. Nevertheless, the legislated requirement for five–year AAC reviews will ensure that future determinations address ongoing plan implementation decisions.

However, where specific protected areas have been designated by legislation or by order in council, these areas are no longer considered to contribute to the timber supply in AAC determinations.

Forest Renewal British Columbia funds a number of intensive silviculture activities that have the potential to affect timber supply, particularly in the long term. As with all components of an AAC determination, like the chief forester, I require sound evidence before accounting for the effects of intensive silviculture on possible harvest levels. Nonetheless, I will consider information on the types and extent of planned and implemented practices as well as relevant scientific, empirical and analytical evidence on the likely magnitude and timing of any timber supply effects of intensive silviculture.

Some have suggested that, given the large uncertainties present with respect to much of the data in AAC determinations, any adjustments in AAC should wait until better data are available. I agree that some data are not complete but this will always be true where information is constantly evolving and management issues are changing. Moreover, in the past, waiting for improved data created the extensive delays that resulted in the

urgency to redetermine many outdated AACs in the province between 1992 and 1996. In any case, the data and models available today are improved from those available in the past, and will undoubtedly provide for more reliable determinations.

Others have suggested that, in view of data uncertainties, the chief forester should immediately reduce some AACs in the interest of caution. However, any AAC determination made by the chief forester or myself must be the result of applying our individual judgment to the available information, taking any uncertainties into account. Given the large impacts that AAC determinations can have on communities, no responsible AAC determination can be made solely on the basis of a response to uncertainty. Nevertheless, in making my determination, I may need to make allowances for risks that arise because of uncertainty.

With respect to First Nations' issues, I am aware of the Crown's legal obligations resulting from court decisions in recent years, including those in the Supreme Court of Canada. The AAC that I determine should not in any way be construed as limiting those obligations under these decisions, and in this respect it should be noted that my determination does not prescribe a particular plan of harvesting activity within TFL 10.

With respect to future treaty decisions, as with other land-use decisions it would be inappropriate for me to attempt to speculate on the impacts on timber supply that will result from decisions that have not yet been taken by government.

Overall, in making this AAC determination, as the deputy chief forester, I am mindful of the chief forester's obligation as steward of the forest land of British Columbia, of the mandate of the Ministry of Forests as set out in Section 4 of the *Ministry of Forests Act*, and of the chief forester's responsibilities under the *Forest Practices Code of British Columbia Act*.

The role of the base case

In considering the factors required under Section 8 of the *Forest Act* to be addressed in AAC determinations, I am assisted by timber supply forecasts provided to me through the work of the Timber Supply Review program for TSAs and TFLs.

For each AAC determination for a TFL, a timber supply analysis is carried out using an information package including data and information from three categories—land base inventory, timber growth and yield, and management practices. Using this set of data and a computer model, a series of timber supply forecasts is produced, reflecting different starting harvest levels, rates of change over time, and potential trade-offs between short- and long-term harvest levels.

From this range of forecasts, one is chosen that attempts to avoid excessive changes from decade to decade and significant timber shortages in the future, while ensuring the long-term productivity of forest lands. This is known as the 'base case' forecast, and forms the basis for comparison when assessing the effects of uncertainty on timber supply.

Because it represents only one in a number of theoretical forecasts, and because it incorporates information about which there may be some uncertainty, the base case forecast for a TFL is not an AAC recommendation. Rather, it is one possible forecast of timber supply, whose validity—as with all the other forecasts provided—depends on the validity of the data and assumptions incorporated into the computer simulation used to generate it. In some cases, an AAC is determined that coincides with the base case starting point. In other cases, an AAC is determined which differs significantly from the modelled starting point.

Therefore, much of what follows in the considerations outlined below is an examination of the degree to which I believe the assumptions made in generating the base case forecast are accurate, current, and complete and the degree to which I believe the base case predictions of timber supply should be adjusted.

Adjustments are made on the basis of informed judgment, using current available information about forest management, which may have changed since the original information package was assembled. Forest management data are particularly subject to change during periods of legislative or regulatory change, such as the enactment of the Forest Practices Code, or during the implementation of new policies, procedures, guidelines or plans.

Thus it is important to remember, in reviewing the considerations which lead to the AAC determination, that while the timber supply analysis with which I am provided is integral to those considerations, the AAC determination itself is not a calculation but rather is a synthesis of judgment and analysis in which numerous risks and uncertainties are weighed. Depending upon the outcome of these considerations, the AAC determined may or may not coincide with the base case forecast. Judgments that may be based in part on uncertain information are essentially qualitative in nature and, as such, are subject to an element of risk. Consequently, once an AAC has been determined, no additional precision or validation may be gained by attempting a computer analysis of the combined considerations to confirm the exact AAC determined.

Timber supply analysis

The timber supply analysis for TFL 10 was prepared by Timberline Forest Inventory Consultants (Timberline) under the direction of licensee staff. Timberline used its proprietary timber supply model Critical Analysis of Schedules for Harvesting (version 6) (CASH 6). This model can be used to project spatially-implicit or spatially-explicit timber supply forecasts. Spatially explicit in this case means that the model accounts for the spatial relationship between mapped cutblocks, while spatially implicit means that the model does not track cutblocks (i.e., it does not track the spatial relationship between cutblocks); rather it approximates the timber supply impacts of implementing spatial restrictions using forest cover constraints.

For this analysis, the licensee used CASH 6 in a spatially-implicit mode for timber supply analysis and the spatially-explicit mode to develop the associated twenty-year plan. Based on a review by BCFS staff, as well as my previous experience reviewing the results

of this model, I am satisfied that the spatially-implicit version of CASH 6 is capable of providing a reasonable projection of timber supply.

The base case harvest forecast maintains an initial harvest level of 171 000 cubic metres per year for 4 decades, then decreases by approximately 10 percent per decade for 4 decades to 112 200 cubic metres per year, before declining another 2 percent to the long-term harvest level of 110 000 cubic metres per year. The harvest levels presented in the base case do not include any volume contribution from deciduous trees and are net of unsalvaged losses.

Review of the base case revealed a modelling error that prevented deciduous stands in visually sensitive areas from reaching visually effective green-up height (see *visually sensitive areas*). While deciduous trees do not contribute directly to timber supply, they do affect timber supply by helping to meet forest cover objectives. This error resulted in a 5300 cubic metre per year underestimation of the long-term timber supply; however, the short- and mid-term timber supply was unaffected.

I am aware of the underestimation in long-term timber supply; however, I note that the short- and mid-term timber supply in the corrected base case does not differ from the original base case. I accept the licensee's assertion that its base case adequately reflects current management practices on TFL 10.

In the timber supply analysis, various sensitivity analyses were conducted to assess the potential implications for timber supply arising from uncertainty in data assumptions and estimates. All the sensitivity analyses prepared for this determination were based on the assumptions used in the base case (i.e., incorporating the incorrect assumptions for deciduous stands in visually sensitive areas). While most of the sensitivity analyses prepared for this determination were based on the uncorrected base case, I requested additional sensitivity analyses based on the corrected base case, where I deemed it to be necessary to appropriately examine the impact of a given factor on timber supply. These sensitivity analyses have also assisted me in considering the factors leading to my determination.

As discussed throughout this rationale, and in consideration of the items described above, I am satisfied that the information presented to me provides an adequate basis from which I can assess the timber supply for TFL 10 for this determination.

Consideration of Factors as Required by Section 8 of the *Forest Act*

Section 8 (8)

In determining an allowable annual cut under subsection (1) the chief forester, despite anything to the contrary in an agreement listed in section 12, must consider

(a) the rate of timber production that may be sustained on the area, taking into account

(i) the composition of the forest and its expected rate of growth on the area,

Land base contributing to timber harvesting

- general comments

As part of the process used to define the timber harvesting land base in the timber supply analysis, a series of deductions are made from the productive forest land base. These deductions account for the factors that effectively reduce the suitability or availability of the productive forest area for harvest, for ecological, economic or social (e.g. parks) reasons. For TFL 10 these reductions result in a long-term timber harvesting land base of 23 582 hectares, or approximately 44 percent of the Crown productive forest land.

I have considered all of the deductions applied in the derivation of the timber harvesting land base.

Factors associated with the derivation of the timber harvesting land base for which, based on my thorough review, I accept the assumptions as modelled in the analysis are not discussed below. These factors include non-commercial brush and low productivity sites.

Where my consideration of the information has identified a factor for which I believe an adjustment is required, or the factor otherwise in my estimation requires discussion in this document, it is described below.

- non-forested and non-productive areas

Non-forested and non-productive areas on TFL 10 include wetlands, alpine areas, lakes, rock, and other non-productive forest. To account for these areas, the licensee excluded 175 954 hectares from the timber harvesting land base. Included in the non-forested and non-productive areas were 328 hectares for which no forest cover information was available. The licensee also identified an additional 2 hectares of non-commercial cover (brush) and appropriately excluded these areas from contributing to timber supply.

I have considered the information presented to me respecting non-forested and non-productive areas and I am satisfied that the reductions applied were appropriate and suitable for use in this determination. For the next determination, I request that the licensee provide information regarding the 328 hectares for which no forest cover information was presented.

- economic and physical operability

The portions of a forest management unit that are not physically accessible for harvesting, or that are not feasible to harvest economically, are categorized as inoperable and are excluded when deriving the timber harvesting land base.

Based upon a 1996 operability assessment, the licensee classified a total of approximately 20 400 hectares as physically and economically inoperable and excluded these areas from the timber harvesting land base. Areas that can be harvested using conventional ground-based harvesting systems totalled 25 620 hectares, areas accessible using helicopter- logging systems totalled 7200 hectares, and areas identified as being marginally economic to harvest due to low volumes and/or a high incidence of decay totalled approximately 500 hectares.

BCFS staff reviewed the operability information and indicate that the licensee has demonstrated performance in the conventional- and helicopter- logging operability classes. They note that the majority of the economically-marginal stands are located in the Toba River portion of the TFL, where no harvesting has occurred since 1989 because the licensee has been unable to secure access through the Klahoose Reserve. Therefore, performance in this operability class has been difficult to assess.

For this determination, I accept the assumptions about economic and physical operability as incorporated in the timber supply analysis.

- roads, trails, and landings

In the timber supply analysis, a percentage of the productive forest was excluded from the timber harvesting land base to account for the losses resulting from the construction of roads, trails, and landings. Separate estimates were made for existing and for future roads, trails, and landings, to reflect both current access and anticipated road network requirements over time.

1) existing roads, trails and landings

In estimating the area occupied by existing roads and trails, the licensee used the road line features in its Geographic Information System (GIS) database. The line features were classified and a road width was assigned based on the licensee's familiarity with the TFL, rather than actual road measurements. The licensee assumed a degraded road width of 10 metres for two-lane gravel roads and 8 metres for one-lane gravel and one-lane rough roads. Application of these width estimates to the road network identified in the GIS database resulted in 128 hectares of productive forest land being excluded from the timber harvesting land base. For the Toba River portion of the TFL, for which no road classification information was available, the licensee estimated that 4 percent of all operable stands currently less than 60 years of age would be unproductive as a result of existing roads. This estimate was derived from the existing road information for the Toba Inlet portion of the TFL and resulted in the exclusion of a further 565 hectares from the timber harvesting land base to account for existing roads.

Based upon their review of operational records, BCFS district staff feel that the road width applied to two-lane gravel roads should have been 14 metres rather than the 10-metre width assumed in the analysis. District staff also note that a 12-metre road width, which was determined on the basis of professional judgment, was assumed in the timber supply review for the adjacent Sunshine Coast TSA.

In order to examine the impact on timber supply of assuming a 14-metre road width, the licensee prepared a sensitivity analysis. The results of this analysis indicate that while the available inventory would be reduced throughout the forecast period, the harvest forecast would be unchanged relative to the base case.

The licensee did not account for trails and landings in its derivation of the timber harvesting land base. According to the licensee, the combination of low impact helicopter logging and current road and landing rehabilitation practices will result in

minimal land productivity losses. According to BCFS district staff, trail and landing rehabilitation is not occurring to any significant extent on the TFL.

I note that the licensee and district staff disagree on the road width assumptions used in the analysis for this determination. However, I note that the sensitivity analysis presented to me does not indicate any significant impact on the harvest forecast. I also accept the premise that only an insignificant incremental loss in productivity will occur because of trails and landings. Therefore, I conclude that the assumptions regarding existing roads, trails, and landings are adequate for use in this determination.

2) future roads, trails and landings

For the purposes of calculating the reduction in the productive land base resulting from roads that will be built in the future, the licensee applied the same 4 percent reduction that was applied to the Toba River portion of the TFL for stands older than 60 years of age. This approach resulted in the exclusion of a further 677 hectares of productive forest from the timber harvesting land base.

BCFS district staff have accepted the methodology used to estimate the area required for future road development. I have reviewed and discussed the information regarding future roads, trails, and landings, and I am satisfied that the assumptions are suitable for use in this determination.

For the next determination, I encourage the licensee, in conjunction with BCFS district staff, to measure road widths for TFL 10.

- environmentally sensitive areas

An environmentally sensitive area (ESA) is an area identified during a forest inventory that is particularly sensitive to disturbance and/or is significantly valuable for resources other than timber. ESA information was originally used to identify areas to exclude in deriving the timber harvesting land base where more specific or detailed information was not available about a particular forest resource.

For this analysis, the licensee excluded 90 percent of all areas identified as having unstable soils (Es1) and 40 percent of all areas identified as having potentially unstable soils (Es2). This resulted in the exclusion of 877 hectares and 1291 hectares respectively from the timber harvesting land base. BCFS district staff have reviewed the assumptions regarding sensitive soils used for this analysis and confirm that they reflect current practice on the TFL and that the licensee is operating appropriately within these areas.

To account for areas of high value for grizzly bear and mountain goat habitat, the licensee excluded 48 hectares and 622 hectares, respectively. MELP staff indicated that the ESA information for grizzly bear habitat is out-dated and only represents a limited amount of the actual habitat requirements for this species on the TFL. I note that forest cover requirements were applied in the base case covering a further 9650 hectares of productive forest identified as grizzly bear habitat. As discussed under *wildlife habitat*, work on the Grizzly Bear Conservation Strategy is ongoing and when it is complete, the location of habitat areas for grizzly bear will be more certain.

Nevertheless, I would like the licensee to work with MWLAP staff to refine the grizzly bear habitat inventory and identify the final areas required for grizzly bear habitat.

For this analysis, 488 hectares and 8384 hectares of productive forest land were identified as having a high (Er1) and moderate (Er2) sensitivity for recreational values, respectively. After allowing for area exclusions for previous factors, 56 hectares of areas classified as Er1 and 1348 hectares, which is 25 percent of the net area classified as Er2, were excluded from contributing to the timber harvesting land base. Therefore, the total area classified as having high or moderate sensitivity for recreational values remaining in the timber harvesting land base was 3325 ha or 37% of the area classified as having high or moderate sensitivity for recreational values.

BCFS staff indicate that in the timber supply review for the adjacent Sunshine Coast TSA, 40 percent of areas identified as having high recreational value were excluded from contributing to the timber harvesting land base. The licensee asserts that its reduction percentage is appropriate for use in the analysis, as TFL 10 is more isolated than the Sunshine Coast TSA and therefore will be used less extensively for recreation. For this determination, I note that the total area identified on TFL 10 as having high recreational value is large and I concur with the licensee's assumptions regarding the probable level of recreational use of this area.

I have reviewed and discussed the information regarding environmentally sensitive areas with BCFS staff and I am satisfied that the assumptions regarding environmentally sensitive areas are based upon the best available information and that they are adequate for use in this determination.

- deciduous stands

A total of 3434 hectares of deciduous-leading stands were identified in the forest cover inventory for TFL 10. After allowing for 1794 hectares of such stands that were excluded for other reasons, the licensee excluded a further 1640 hectares (or 6 percent of the timber harvesting land base) from contributing to timber supply. Volume reductions were applied to yield tables to account for the minor deciduous component in conifer-leading stands.

BCFS district staff confirm that the licensee does not harvest deciduous stands and that it has not indicated any plans to convert these to stands to conifer species. In any event, district staff note that about 75 percent of the 1640 hectares excluded from the timber harvesting land base are located in the Toba River portion of the TFL, where no harvesting has occurred since 1989.

I have reviewed and discussed the information regarding deciduous stands with BCFS staff and I accept that the assumptions used in the base case reflect current practice, and are therefore suitable for use in this determination. I note that the deciduous-leading stands excluded from the timber harvesting land base in the analysis represent a significant proportion (6 percent) of the timber harvesting land base. Therefore, if these stands become merchantable in the future, they will contribute significantly to the timber supply of this TFL.

Existing forest inventory

The inventory data used for the timber supply analysis is based on a forest inventory completed in 1978. In 1988 and 1989, the licensee completed an inventory of second growth stands over ten years of age. For the analysis, the inventory file was updated to September 1999 to account for growth and depletion. The BCFS Vancouver Forest Region and Resources Inventory Branch decided not to conduct an audit of the inventory for TFL 10 due to the access problem with a large proportion of the TFL, the very high access costs, and lack of funding for an audit.

I have considered the information about the forest inventory, and am satisfied that the best available information was used in the analysis.

With respect to existing stand volume estimates, I have considered the information and am satisfied that the analysis assumptions were appropriate.

Expected rate of growth

- site productivity estimates

Inventory data includes estimates of site productivity for each forest stand, expressed in terms of a site index. The site index is based on the stand's height as a function of its age. The productivity of a site largely determines how quickly trees grow. This in turn affects the time seedlings will take to reach green-up conditions, the volume of timber that can be produced, and the ages at which a stand will satisfy mature forest cover requirements and reach a merchantable size.

In general, in British Columbia, it has been found that site indices determined from younger stands (i.e., less than 31 years old), and older stands (i.e., over 150 years old) may not accurately reflect potential site productivity. In young stands, growth often depends as much on recent weather, stocking density and competition from other vegetation, as it does on site quality. In old stands, where stocking density has not been controlled, the trees used to measure site productivity may have grown under intense competition or may have been damaged, and therefore may not reflect the true growing potential of the site. This has been verified in several areas of the province where studies—such as the Old-Growth Site Index (OGSI) 'paired plot' project and the 'veteran' study—as well as results from using the Site Index Biogeoclimatic Ecosystem Classification System (SIBEC) suggest that actual site indices may be higher than those indicated by existing data from old-growth forests. In recent years it has been concluded from such studies that site productivity has generally been underestimated by older inventories; managed stands tend to grow faster than projected by inventory-based site index estimates from old-growth stands.

No local information was available to provide for the adjustment of the old growth site indices for TFL 10; therefore, the licensee used unadjusted site indices for regenerating stands in the base case. A sensitivity analysis was provided by the licensee to examine the effect on timber supply of applying the provincial OGSI site index adjustments to stands older than 140 years of age after they were harvested in the model. In this sensitivity analysis the mid-term harvest level was increased by 55 percent and the

long-term harvest level was increased by 36 percent compared to the base case.

BCFS Research Branch staff reviewed and accepted the assignment of site indices from the forest cover inventory for stands in the base case and they also reviewed the information used in the OGSI sensitivity analysis and found it to be suitable for this purpose. BCFS staff indicate that while the magnitude of the site index adjustments that will be determined through localized studies is uncertain, it is expected to be in the general range applied in the sensitivity analysis.

I have reviewed and discussed the information regarding site productivity estimates with BCFS staff. I am mindful that using provincially based site index adjustments for relatively small areas, such as TFL 10, results in timber supply projections that are subject to considerable uncertainty. Nevertheless, I conclude that the actual site productivity is probably higher than indicated in the base case. Therefore, the mid- to long-term base case timber supply has probably been underestimated by a significant, albeit unquantified, amount and I have accounted for this in my determination, as discussed in "Reasons for decision". In view of the significant impact this factor may have on the long-term timber supply for this TFL, I encourage the licensee to collect localized site productivity information for consideration in the next determination.

- volume estimates for managed stands

Managed stands for TFL 10 were defined as all stands 30 years of age or less and all stands regenerated in the future. In the analysis, the licensee assumed that for all stands regenerated in the future, 80 percent of the area would be planted and 20 percent of the area would be naturally regenerated.

The Table Interpolation Program for Stand Yields (TIPSY) model, developed by the BCFS Research Branch, was used to estimate volumes for managed stands. The managed stand yield tables were reviewed and accepted by Research Branch staff for use in the analysis.

A sensitivity analysis prepared by the licensee to assess the impact on timber supply of increasing or decreasing the managed stand yields by 10 percent indicated that there was no impact on the base case initial harvest level. Increasing the managed stand yields by 10 percent increased the long-term harvest level by approximately 12 percent; whereas, decreasing the managed stand yields by 10 percent decreased the long-term harvest level by approximately 8 percent. BCFS staff indicate that the non-proportional response of long-term harvest levels to changes in the managed stand yields is due to the confounding effect of forest cover objectives on the harvest forecast.

I have reviewed the volume estimates for managed stands and discussed these with BCFS staff and I am satisfied that they are suitable for use in this determination.

- operational adjustment factors

TIPSY projections are initially based on ideal conditions, assuming full site occupancy and the absence of pests, diseases, and significant brush competition in the stand. Certain operational conditions, such as less than ideal tree distribution, small non-productive

areas, endemic pests and diseases, or age dependent factors such as decay, waste, and breakage cause actual yields to be less than the theoretical TIPSY yields over time. Operational adjustment factors (OAFs) are applied to yields generated using TIPSY to account for losses of timber volume resulting from these operational conditions. OAF 1 accounts for factors affecting the yield curve across all ages, including small stand openings, tree distribution, endemic pests, and other factors. OAF 2 accounts for decay, waste, and breakage.

In the analysis, the standard provincial reduction of 15 percent for OAF 1 was applied. The licensee also applied the standard provincial reduction of 5 percent for OAF 2 to Douglas-fir leading stands; however, for all other species it applied an OAF 2 of 15 percent. According to the licensee, this additional adjustment was necessary because it brings projected managed stand yields in line with its expectations regarding managed stand yields. BCFS Research Branch accepted the OAFs applied in the base case.

I have reviewed and discussed the information regarding OAFs used in the base case with BCFS staff and I accept them as being based upon the best available information and adequate for use in this determination. For the next determination, I request that the licensee provide empirical evidence to confirm its higher OAF 2 assumptions.

- minimum merchantability standards

In timber supply analysis, estimates are made of the earliest age at which a forest stand has reached a harvestable condition or has met minimum merchantability criteria. The assumptions largely affect when second growth stands will be available for harvest in the model. In practice, many forest stands will be harvested later than the age at which they reach minimum merchantability, due to economic considerations and constraints on harvesting that arise from managing for other forest values such as visual quality, wildlife and water quality.

In the TFL 10 timber supply analysis, minimum harvestable age estimates were based on a stand attaining mean annual increment (MAI) culmination age (the age at which the volume/age ratio is at a maximum).

BCFS district staff were concerned that the modelled volume per hectare at MAI culmination age is less than 300 cubic metres for some of the analysis units used in the analysis.

The licensee provided a sensitivity analysis in which increasing the minimum harvestable age by 10 years resulted in a 9-percent reduction in the mid-term timber supply. Decreasing the minimum harvestable age by 10 years resulted in a 1.6- percent increase in the short-term timber supply. BCFS staff reviewed the results of this sensitivity analysis and noted that there was no harvesting in the model of stands with volumes less than 300 cubic metres per hectare until the ninth decade. In this decade only 1 percent of the area harvested in the analysis consisted of stands with a volume of less than 300 cubic metres per hectare.

A second sensitivity analysis assumed that stands could not be harvested until their average diameter reached 35 centimetres at breast height (dbh). On this basis, the length

of time the initial harvest level could be maintained dropped to one decade instead of the four decades modelled in the base case.

I accept the assumptions regarding minimum harvestable age as adequate for use in this determination. However, I note that this factor is subject to some uncertainty and that the mid-term timber supply is sensitive to increases in minimum harvest age and application of a minimum 35-centimetre dbh limit. Therefore, I request that the licensee review and substantiate its assumptions for defining minimum harvestable ages, and assess the impact of adjusting these ages on dbh and timber supply, prior to the next determination.

With respect to the base case harvest profile and sequencing assumptions, I have considered the information and am satisfied that these assumptions were appropriate. As a result, I will not discuss my considerations in detail in this document.

(ii) the expected time that it will take the forest to become re-established on the area following denudation,

Expected time for forest to be re-established following harvest

I have reviewed the information regarding regeneration and not-satisfactorily-restocked areas, and I am satisfied that the assumptions in the analysis for these factors were appropriate. As a result, I will not discuss my considerations of these factors in this rationale.

- *regeneration delay*

Regeneration delay is the period between harvesting and the time at which an area becomes occupied by a specified minimum number of acceptable, well-spaced seedlings. In timber supply analysis, regeneration delay is used to determine the starting point after harvest of tree growth for the yield curves that project volumes over time.

According to the licensee's proposed MP No. 8, the majority of harvested stands are to be planted within one year of harvesting. In the base case, a four-year regeneration delay for all planted stands and a six-year regeneration delay for all naturally-regenerated stands was assumed.

BCFS district staff inform me that the actual regeneration delay on TFL 10 is likely decreasing and indicate that a regeneration delay of three years would be more reflective of current practice.

The licensee did a sensitivity analysis that tested the effect of increasing and decreasing the assumed regeneration delay by one year. The results indicate that the harvest levels forecast in the base case are relatively insensitive to changes of this magnitude.

I have reviewed the information regarding regeneration delay with BCFS staff and I note that the base case regeneration delay assumptions are greater than experienced in practice. However, for this determination I note that the over-estimation of regeneration delay has no significant impact on the projected timber supply; therefore, I will make no adjustment to the base case forecast on account of this factor. For the next determination I request that the licensee review and refine its regeneration delay assumptions.

(iii) silviculture treatments to be applied to the area,

Silvicultural treatments to be applied

I have reviewed the information regarding silvicultural systems, commercial thinning and incremental silviculture, and I am satisfied that the base case assumptions for these factors were appropriate. I will not discuss my considerations of these factors in this rationale.

- select seed

The Forest Practices Code requires the use of the best genetic quality (seed and vegetative material) source available for regeneration. Select seed produced from seed orchards is the product of British Columbia's forest gene resource management program, which uses traditional tree breeding techniques to select naturally-occurring, well-adapted, healthy and vigorous trees.

Select seed produces trees that grow faster than trees that germinated from natural stand seed for a specific time, which varies by species and site. As a result, a stand that originates from select seed has a greater volume at the same age than a natural stand with the same species composition. Current expectations are that the volume differences will begin to decrease beyond a certain stand age.

The base case forecast did not account for the use of select seed for reforestation on TFL 10. According to the licensee, select-seed seedlings are used for 35 percent of planted stands. The expected genetic gain in volume for these seedlings is 7 percent.

BCFS district staff have reviewed the information regarding the use of select seed and confirm that the information provided by the licensee is reflect current practice on TFL 10.

The licensee provided a sensitivity analysis to test the impact on timber supply of planting select-seed seedlings. Increasing the managed stand yields by 2.5 percent (7 percent X 35 percent) resulted in approximately a 3-percent increase in the long-term timber supply compared to the base case.

Based upon my review of the information regarding the use of select seed and my discussions with BCFS staff, I conclude that the base case probably underestimated the productivity of regenerating stands that originate from select seed. Therefore, for this determination I am accounting for up to a 3-percent increase in the long-term harvest level and I will discuss this further under "Reasons for decision".

(iv) the standard of timber utilization and the allowance for decay, waste and breakage expected to be applied with respect to timber harvesting on the area,

Timber harvesting

I have reviewed the information regarding the utilization standards and the decay, waste and breakage factors assumed in the analysis for TFL 10, and I am satisfied that these factors were appropriately modelled in the base case. As a result, I will not discuss my considerations in this rationale.

(v) the constraints on the amount of timber produced from the area that reasonably can be expected by use of the area for purposes other than timber production,

Integrated resource management objectives

The Ministry of Forests is required under the *Ministry of Forests Act* to manage, protect and conserve the forest and range resources of the Crown and to plan the use of these resources so that the production of timber and forage, the harvesting of timber, the grazing of livestock and the realization of fisheries, wildlife, water, outdoor recreation and other natural resource values are coordinated and integrated. Accordingly, the extent to which integrated resource management (IRM) objectives for various forest resources and values affect timber supply must be considered in AAC determinations.

I have reviewed the information regarding water resources, cutblock adjacency/green-up, and recreation resources assumed in the analysis for TFL 10, and I am satisfied that these factors were appropriately modelled in the base case. As a result, I will not discuss my considerations in this rationale.

- cultural heritage resources

Cultural heritage resources generally include archaeological and traditional use sites. Archaeological sites contain physical evidence of past human activity, whereas traditional use sites may not necessarily contain historical physical evidence but may indicate current use by a First Nation. To help manage for unrecorded archaeological sites, archaeological overview mapping may be conducted to assign high, moderate or low ratings for archaeological potential within an area.

To the extent that any significant cultural and heritage values are present on TFL 10, they could be associated with the activities of First Nations or with early exploration and settlement by Europeans. To date, no archaeological overview mapping has been completed. One archaeological site has been identified near the mouth of the Tahumming River. However, the site lies within a riparian reserve; therefore, no additional land base exclusion was needed to account for this area in the analysis. No other archaeological or cultural heritage sites have been identified on TFL 10. As a result, no explicit accounting for cultural heritage resources was included in the analysis. BCFS district staff indicate that the analysis assumptions appropriately reflect current practice. The licensee has committed in its draft Management Plan No. 8 to manage any cultural heritage resources in consultation with First Nations.

I have reviewed the information regarding cultural heritage resources, and note the licensee's commitment to manage for these resources at the operational planning level. As sites are identified, the information can be incorporated into future determinations for TFL 10. I am satisfied that the assumptions used in the base case are suitable for use in this determination.

- riparian habitat

Riparian habitats occur along streams and around lakes and wetlands. The Forest Practices Code requires the establishment of riparian reserve zones (RRZs) that exclude

timber harvesting, and riparian management zones (RMZs) that restrict timber harvesting in order to protect riparian and aquatic habitats. For each stream, lake or wetland, the RRZ and RMZ make up the entire riparian management area. Stream riparian classes are described in the *Riparian Management Area Guidebook* and are determined based on presence of fish, occurrence in a community watershed, and average channel-width criteria. The stream class is used to estimate the area required to be retained in the RRZ and the area or volume to be managed as the RMZ.

For the timber supply analysis, the licensee used a 1999 stream classification for TFL 10, which used map-based gradient analysis, information from operational plans, and field knowledge, and the *Riparian Management Area Guidebook* to estimate the area of RRZs and RMZs associated with streams, lakes, and wetlands on TFL 10. One hundred percent of the area in RRZs was excluded from the timber harvesting land base. In addition, the licensee excluded the area of the RMZs derived from the maximum recommended buffer width for a given stream, lake, or wetland classification. The S3-buffer width was increased by five metres from the 30 metres recommended in the guidebook to account for the possibility that some S3 creeks may in fact be S2 creeks.

In total, the above approach resulted in the exclusion of approximately 2440 hectares for streams and 390 hectares for lakes and wetlands from the timber harvesting land base. Stands growing on areas associated with RRZs and RMZs that were excluded from the timber harvesting land base were assumed to contribute to landscape-level forest cover objectives.

According to the licensee and MWLAP staff, in practice less area is reserved from harvesting than was assumed in the base case. In fact, according to the licensee the RMZ buffer width applied operationally is usually closer to the lower end of the range for RMZ buffer widths specified in the *Riparian Management Area Guidebook*.

I have reviewed and discussed the information regarding riparian areas with BCFS staff. I note that there is some uncertainty regarding the assumptions used in the analysis; however, I conclude that any change to the riparian assumptions of the magnitude that is likely for TFL 10 only affects the long-term timber supply by a small amount and there is no effect on short- to mid- term timber supply. Therefore, for this determination, I have made no adjustments on this account.

- visually sensitive areas

Careful management of scenic areas visible from communities, public use areas, and travel corridors is an important forest management objective. The Forest Practices Code enables the management of visual resources by providing for scenic areas to be identified and made known, and by providing for the establishment of visual quality objectives (VQOs) that guide the management practices on a scenic area. To achieve this, visual landscape inventories are carried out to identify, classify, and record visually sensitive areas. On completion of such an inventory, a specialist may derive recommended visual quality objectives (RVQOs) of preservation, retention, partial retention, modification or maximum modification to identify levels of alteration that would be appropriate for

particular areas. Visually sensitive areas can be identified by the district manager or in a higher level plan, and can be made known to licensees. The district manager or a higher level plan may also establish VQOs or recommended visual quality classes (RVQCs) to manage and conserve the visual resources in the scenic areas. Scenic areas with VQOs were established by the BCFS district manager in 1997. In 1999, the district manager revised the management requirements in the scenic areas by changing the VQO requirements of two stands from partial retention to modification. The revised VQO requirements were incorporated in the base case for this determination.

To manage for visual quality, constraints are placed on timber harvesting, road building, and other forest practices. The constraints, which are based on experience, research findings, and public preferences, are expressed in terms of forest cover requirements that relate to the maximum percentage of a viewshed that may be harvested at any one time, and to 'visually effective green-up' (VEG)—the stage at which a stand of reforested timber is perceived by the public to be satisfactorily greened-up from a visual standpoint.

For the base case, the licensee followed the procedures outlined in *Procedures for Factoring Visual Resources into Timber Supply Analyses* to calculate the allowable percent denudation for each visual quality class. This approach resulted in the application of a 9.7 percent and 19.1 percent area-weighted average allowable alteration in the partial retention and modification VQOs in the Brem landscape unit. For the Homfray landscape unit, an area-weighted average of 20 percent was derived for the modification VQO. In total, forest cover objectives intended to account for the management of visual resources were applied to approximately 3000 hectares within the Toba Inlet portion of TFL 10.

In the base case for TFL 10, the intended VEG height for regenerated stands was 5 metres. BCFS district staff inform me that this VEG height is consistent with the value assumed in the recently completed timber supply analysis for the adjacent Sunshine Coast TSA. A sensitivity analysis, which examined the effects on the base case of applying the minimum and maximum denudation outlined for each VQO in the *Procedures for Factoring Visual Resources into Timber Supply*, was prepared by the licensee. Applying the minimum percent allowable denudation resulted in a 1-decade reduction in the length of time the initial harvest level could be maintained in the analysis. Applying the maximum percent allowable denudation had no impact on timber supply.

Review of the base case indicated that due to a modelling error, deciduous stands in visually sensitive areas never reached VEG height. Correction of this error in the base case had no impact on the short- and mid-term timber supply; however, the long-term timber supply increased by about 5 percent to 115 300 cubic metres per year.

I have reviewed and discussed the information regarding visually sensitive areas with BCFS staff and I generally accept that the best available information and appropriate procedures were used in the base case. However, I note that due to the error in modelling VEG height, the long-term harvest level projected in the base case is 5300 cubic metres per year lower than it should be. Therefore, for this determination, I have concluded that the long-term harvest level, has been underestimated and I will discuss this further in my 'Reasons for decision'.

- wildlife habitat

1) identified wildlife

For wildlife species considered to be at risk, the Conservation Data Centre of British Columbia maintains forest district tracking lists. Each list names the species and plant associations considered to be at risk (e.g., endangered, threatened, vulnerable or sensitive) and which are known to occur, strongly expected to occur, or which have occurred in the past within a given forest district. The Identified Wildlife Management Strategy (IWMS) addresses habitat management for specific species considered to be at risk, as described in the next section.

Wildlife potentially occurring within or adjacent to TFL 10 include numerous *identified wildlife* species. These include northern goshawk, marbled murrelet, Keen fisher, Keen's long-eared myotis, tailed frog, bull trout, fisher, grizzly bear and mountain goat. *Identified wildlife* refers to species at risk (red- and blue-listed) as well as regionally significant species that are potentially affected by forest management activities and that may not have been adequately accounted for through existing management strategies. While the biodiversity and riparian provisions of the Forest Practices Code are intended to provide for the needs of most wildlife species, some species that are considered to be "at risk" require special management practices. The Province's *Identified Wildlife Management Strategy* (IWMS)—released in February 1999—provides mechanisms for managing critical habitat for identified wildlife species including Wildlife Habitat Areas (WHAs), General Wildlife Measures (GWMs) and higher level plan recommendations.

For this determination, no information is available to specify the exact location or precise amount of WHAs that will be required within the timber harvesting land base to implement the IWMS. However, I note that government has limited the impact of management for identified wildlife in the short term to a maximum of one percent of the harvest level for the province. Given the Province's commitment to implementing the IWMS, and given the policy decisions and projected one-percent impact—and noting the expected occurrence of identified wildlife within TFL 10—I find it necessary and appropriate to account for an expected but not fully quantified impact on the timber supply. I therefore conclude that timber supply may be up to one percent lower than projected in the base case and have considered this in 'Reasons for decision'.

As the Province implements its strategy for the management of species at risk, I expect the specific implications to be reflected in future timber supply analyses for TFL 10 and these will be taken into account in future AAC determinations.

2) grizzly bear

Two grizzly bear zones have been identified on TFL 10: the GB-a zone, which includes areas in the alpine, along avalanche chutes, and in primary denning habitat and the GB-b zone, which includes areas on valley bottoms. For the GB-a zone, a forest cover objective was applied in the base case that required 75 percent of the productive area be covered in stands older than 250 years of age. This objective was applied to

3107 hectares of productive forest of which1709 hectares contribute to the timber harvesting land base. For the GB-b zone, a forest cover objective was applied in the base case that allowed no more than 30 percent of the productive area to be covered with stands younger than 40 years of age, and at least 36 percent of the productive area to be covered with stands older than 80 years. These objectives were applied to 6545 hectares of productive forest of which 2635 hectares contribute to the timber harvesting land base.

According to the licensee, in accordance with the recommendations in the *Establishment to Free Growing Guidebook*, it is establishing low-density plantations (i.e., 600 trees per hectare) on wet sites and toe-slopes to improve grizzly bear habitat in the long term. No information was available at the time of this determination to quantify the actual area that was treated in this manner. However, based upon their review of silviculture prescriptions, BCFS district staff indicate that the area managed for low stocking is relatively small.

While no formal establishment of grizzly bear management or habitat areas has occurred through a higher level plan, according to MELP staff, identification of key grizzly habitat is ongoing and forest cover objectives for grizzly habitat have been under review since the release of the *Grizzly Bear Conservation Strategy* , which is to be implemented under the *Identified Wildlife Management Strategy*. In the meantime, MELP staff indicated that the assumptions used in the base case are adequate for modelling purposes.

The licensee provided a sensitivity analysis that examined the impact on timber supply of increasing and decreasing the old forest retention requirement for grizzly habitat by 5 percent. This analysis indicates that timber supply for TFL 10 is not sensitive to these changes.

I have reviewed and discussed the information regarding grizzly bear habitat with BCFS and MELP staff. I recognize that there is still some uncertainty regarding habitat areas and forest cover objectives for grizzly habitat; however, until the implementation of the *Grizzly Bear Conservation Strategy* is complete, the assumptions used in the base case represent the best available information. I expect that any new information will be incorporated in the next timber supply analysis for this TFL.

3) ungulate winter range

TFL 10 provides habitat for a number of large wildlife species, including mountain goat. Areas for mountain goat were identified by the district manager and established as ungulate winter range (UWR) under the Operational Planning Regulation (OPR) in October 1998.

In accordance with section 69(2) of the OPR, an ungulate winter range that is identified in a wildlife management plan or strategy approved before October 15, 1998 ceases to be an ungulate winter range on October 15, 2003 unless confirmed before that date by the chief forester and Deputy Minister of Water, Land, and Air Protection (MWLAP). The process leading to the confirmation of ungulate winter ranges is ongoing and the final extent of the areas that will be established is unknown.

In the base case, the licensee applied a 90 percent land base reduction to areas included in

the established UWR. A total of 1134 hectares were identified as mountain goat winter range of which 622 hectares were excluded from the timber harvesting land base after other, previous land base exclusions.

MWLAP and licensee staff recently refined the UWR mapping and this resulted in the exclusion of an additional 261 hectares from the timber harvesting land base. A sensitivity analysis prepared by the licensee based upon the revised UWR mapping indicated that there was no effect on timber supply relative to the base case.

MWLAP staff indicated that the alternative UWR mapping did not include five recently identified mule deer winter ranges that face Toba Inlet. The licensee has confirmed that these polygons were missed and that it had intended to apply a forest cover objective for these stands. This objective would require that a maximum of 20 percent of the area be covered in stands less than 20 years of age and that a minimum of 20 percent of the area be covered by stands older than 80 years of age.

BCFS staff reviewing the analysis indicate that it is likely that application of the forest cover objectives for these five areas would have a small impact on timber supply, likely in the long term.

MWLAP staff provided a map delineating proposed UWR in the Tahumming and Toba River drainages. MWLAP and licensee staff have agreed to review the proposed areas and when they have reached agreement on the areas found to be suitable for UWR, they will request that they be established as such. According to MWLAP staff, the total area contained in the proposed UWR, including those agreed to by the licensee, covers 15 961 hectares of which 9891 hectares are forested. BCFS staff have indicated that the impacts on timber supply of UWRs that may eventually be designated is unknown.

I have reviewed and discussed the information regarding ungulate winter range with BCFS and MWLAP staff. I am mindful of the uncertainty regarding the eventual area that will be subject to forest cover objectives for ungulate winter range. I encourage the licensee to work with BCFS and MWLAP staff to complete the identification and establishment of ungulate winter range on TFL 10 and provide information regarding any potential impacts on timber supply at the next determination. For this determination, I conclude that the assumptions used in the base case were based upon the best available information and are adequate for use in this determination. In any event, any potential impacts on timber supply appear to affect only the long-term timber supply and can be clarified at the next determination.

- landscape-level biodiversity

Biodiversity is defined as the full range of living organisms, in all their forms and levels of organization, and includes the diversity of genes, species and ecosystems and the evolutionary and functional processes that link them. Under the Forest Practices Code, biodiversity in a given management unit is assessed and managed at both the landscape and stand levels.

Achieving landscape-level biodiversity objectives involves maintaining forests with a variety of patch sizes, seral stages, and forest stand attributes and structures, across a

variety of ecosystems and landscapes. A major consideration in managing for biodiversity at the landscape level is leaving sufficient and reasonably located patches of old-growth forests for species that are dependent on or are strongly associated with old-growth forests. Although some general forest management practices can broadly accommodate the needs of most ecosystems, more often a variety of practices are needed to represent the different natural disturbance patterns under which ecosystems have evolved.

The delineation and formal designation of 'landscape units' is a key component of a sub-regional biodiversity management strategy. A landscape unit is an area established by the district manager, generally up to 100 000 hectares in size, based on topographic or geographic features such as a watershed, or series of watersheds, to manage biodiversity and other forest resource values.

The *Biodiversity Guidebook,* the *Landscape Unit Planning Guide* and *Higher Level Plans: Policy and Procedures* all provide policy and guidance on management for landscape-level biodiversity. The *Landscape Unit Planning Guide* provides guidance on which components of the full range of recommendations included in the *Biodiversity Guidebook* should be implemented to achieve a balance of forest management objectives. The *Landscape Unit Planning Guide* contains forest cover constraints for old seral forest that are recommended for application at the biogeoclimatic variant level within each landscape unit. The recommendations are stated as a minimum percentage of the productive forest to be retained in stands above a specified age that varies by ecosystem type. The guide also allows the old seral requirement to be phased in over time in landscape units with a lower biodiversity emphasis.

The 1996 Higher Level Plans: Policy and Procedures guide provides further policy guidance. It outlines three biodiversity emphasis options (BEOs)—lower, intermediate and higher—that may be employed when establishing biodiversity management objectives for a landscape unit. To achieve a balance between biodiversity and timber supply objectives, this guide recommends the application of a mix of BEOs in each subregional planning area. The proportions of a planning area subject to lower and intermediate biodiversity emphasis should range from 30 to 55 percent, with the average at approximately 45 percent of the area subject to lower, 45 percent to intermediate, and 10 percent to a higher BEO (45-45-10).

TFL 10 falls within the Brem, Homfray, and Toba draft landscape units, which have been assigned draft BEOS of intermediate, intermediate, and high, respectively. Because these draft BEOs have no standing, in the base case the licensee modelled the provincial distribution of 45-45-10 to calculate the percentages of the land base in each variant that needed to be retained in old seral forest over time.

The licensee incorporated three key assumptions in the base case. Firstly, the 45-45-10 distribution for the draft landscape units was assumed to be met solely within the boundaries of TFL 10. Secondly, the full old-growth retention was implemented immediately (i.e., no phasing in of old-growth retention in areas with lower BEOs was permitted). And thirdly, only old seral stage retention constraints were employed. That is, the base case did not model the retention of minimum

amounts of "mature plus old" forest.

According to the licensee, it reviewed the timber supply impact of permitting a phasing-in of old-growth requirements in areas of lower BEO and it found that there was no difference relative to the base case. The licensee also conducted a number of sensitivity analyses. Increasing the old seral stage requirement by 5 percent or introducing "mature plus old" requirements resulted in a one-decade reduction in the duration of the initial harvest level. In a separate analysis, applying the draft BEO requirements had no impact on timber supply relative to the base case.

BCFS staff have reviewed the assumptions used in the base case and indicate that, with the exception the requirement to meet the full old seral stage requirement immediately in all areas, the licensee used standard procedures for modelling landscape level biodiversity.

I have reviewed the information regarding landscape-level biodiversity on TFL 10 and conclude that the landscape-level biodiversity assumptions incorporated in the base case are acceptable for use in this determination.

- stand-level biodiversity

Stand-level biodiversity is managed by retaining reserves of mature timber, or wildlife tree patches (WTPs), within cutblocks and in adjacent inoperable and other retained areas to provide structural diversity and wildlife habitat. The *Landscape Unit Planning Guide* outlines procedures and makes recommendations on the proportion of a cutblock that is required in wildlife tree retention.

For this analysis, the licensee followed the standard procedures outlined in the *Landscape Unit Planning Guide* to derive an incremental yield table reduction of 1.25 percent to account for WTPs on TFL 10. This is based on an assumption that 5 percent of each cutblock will be retained as WTPs, and that 75 percent of that retention will be achieved in areas that are netted out of the timber harvesting land base for other reasons. BCFS district staff indicate that the methodology used was appropriate and represents current practice on the TFL.

I am satisfied that the assumptions used in the base case for stand level biodiversity reflect current practice and are appropriate for use in this determination.

(vi) any other information that, in the chief forester's opinion, relates to the capability of the area to produce timber,

Other information

Twenty-year plan

On behalf of the licensee, Timberline Forest Inventory Consultants (Timberline), used the spatially-explicit mode of CASH6 (see "Timber supply analysis") to develop its twenty-year plan (TYP).

The harvest level used in the twenty-year plan was based upon the harvest level projected in the base case. The initial 5-year period of the TYP included the blocks identified in the current forest development plan. BCFS district staff have reviewed the twenty-year plan submitted by the licensee and are satisfied that the harvest level proposed in the base case can be achieved for a period of 20 years.

The district manager accepted the licensee's twenty-year plan on August 7, 2001.

I have reviewed and discussed the information regarding the TYP with BCFS staff and I am satisfied that the first two decades of the base case harvest projection is operationally obtainable, although not necessarily in the precise locations indicated in the TYP. I have been mindful of this information in my consideration of an appropriate harvest level for TFL 10.

Toba River road access agreement

Access to areas within the Toba River drainage through the Klahoose First Nation (Klahoose) reserve, which is located at the mouth of the Toba River, has been prevented since 1988 due to the lack of a negotiated road access agreement between the Klahoose and the licensee. As a consequence, the licensee has been unable to undertake harvesting or management activities on the 15 870 hectares of timber harvesting land base within the Toba River drainage.

In his rationale for the 1996 AAC determination, the chief forester established a partition of 115 950 cubic metres for the Toba River portion of the TFL. BCFS staff indicate that a road access agreement between the licensee and the Klahoose has not been negotiated and that the licensee's harvesting activities continue to be limited to the Toba Inlet portion of the TFL.

In a sensitivity analysis prepared by the licensee, excluding the Toba River drainage area from the timber harvesting land base for TFL 10, resulted in a decrease in the initial harvest level to 56 800 cubic metres per year, which is 67 percent below the base case level and a decrease in the long-term harvest level to 39 100 cubic metres, which is 64 percent below the base case level.

In view of the continued lack of a road access agreement between the licensee and the Klahoose and the magnitude of the potential impact on the projected timber supply for TFL, I conclude that it is necessary to maintain the partition in the AAC for the Toba Inlet and Toba River portions of TFL 10 and I will discuss this further in my "Reasons for decision".

(b) the short and long-term implications to British Columbia of alternative rates of timber harvesting from the area,

Alternative rates of harvest

- harvest flow/socio-economic implications

The nature of the transition from harvesting old growth forests to harvesting second growth forests is a major consideration in determining AACs in many parts of the

province. In the short term, the presence of large timber volumes in older forests often permits harvesting above long-term levels without jeopardizing future timber supply. In keeping with the objectives of good forest stewardship, AACs in British Columbia have been and continue to be determined to ensure that current and medium-term harvest levels will be compatible with a smooth transition toward the usually (but not always) lower long-term harvest level. Thus, timber supply should remain sufficiently stable so that there will be no inordinately adverse impacts on current or future generations. To achieve this, the AAC determined must not be so high as to cause later disruptive shortfalls in supply nor so low as to cause immediate social and economic impacts that are not required to maintain forest productivity and future harvest stability.

The licensee used the spatially-implicit version of CASH6 to prepare one harvest flow alternative to the base case forecast starting at the highest initial harvest level that could be achieved while keeping future declines to a maximum of 10 percent per decade until the long-term harvest level is reached. In this alternative an initial harvest level of 211 200 cubic metres per year (24 percent higher than the base case initial harvest level) was maintained for one decade followed by a staged decline to the same long-term harvest level projected in the base case.

I have reviewed the alternative rate of harvest modelled by the licensee and I note that it is possible to harvest significantly more volume than indicated in the base case for two decades without affecting the long-term harvest level. I have reviewed the information presented to me regarding alternative rates of harvest and I have taken that information into consideration in my determination.

- community dependence on the forest industry

Based upon 1998 figures, the licensee estimates that operations on TFL 10, which are provided completely under contract by Hayes Forest Services Ltd., account for 16.5 direct and indirect jobs. Hayes Forest Services Ltd. is based in the community of Duncan on Vancouver Island. This level of employment is based on operations in the Toba Inlet portion of the TFL.

I have reviewed and discussed the information regarding community dependence on the forest industry with BCFS staff.

- difference between AAC and actual harvest

As provided for in the *Forest Act*, TFL holders have flexibility in the rate of timber harvesting that is referred to as cut control. The volume harvested must be within 50 percent of the AAC that is authorized in each year (annual cut control), and also within 10 percent of the total of the AACs for the five-year period (periodic cut control).

BCFS district staff indicate that the licensee has undercut the Toba Inlet portion by about 15 percent and that there has been no recent harvesting in the Toba River portion of the TFL, including the last five-year period.

I have reviewed the actual harvest over the past five years relative to the AAC, and I have considered that information in my determination, as discussed below under Partitioned component of the harvest.

Partitioned component of the harvest

The AAC for TFL 10 has been partitioned since 1992. The chief forester specified a partition in response to ongoing road access discussions between the licensee and the Klahoose First Nation. Due to lack of agreement on conditions of road access through the Klahoose reserve, no harvesting has occurred in the Toba River portion of the TFL since December 1989. Harvesting operations have been concentrated within the Toba Inlet portion of the TFL. Of the AAC prior to this determination, 55 000 cubic metres was attributed to the Toba Inlet part of the TFL, and the balance of 115 950 cubic metres was attributed to the Toba River area.

In recognition that access to the Toba River area may continue to be problematic, and to ensure that harvesting is not concentrated in the Toba Inlet portion of the TFL in an attempt to achieve a harvest level for the entire TFL, I believe that a partitioned AAC remains appropriate.

A partition was not represented in the base case; however, the licensee provided a base case harvest forecast for the Toba Inlet portion alone. This analysis showed that a harvest level of 56 800 cubic metres per year is attainable in the Toba Inlet portion for four decades before decreasing in approximately 9-percent decrements to a long-term harvest level of 39 100 cubic metres per year. I also requested a revised base case harvest forecast for the Toba Inlet that corrects the error in modelling deciduous stands in visually sensitive areas (see *visually sensitive areas*). In this revised analysis, the initial harvest level of 56 800 cubic metres per year was still maintained for four decades; however, the long-term harvest level increased by 4 percent to 40 600 cubic metres per year.

I accept the assumptions used to model the partition and have fully accounted for this information in "Reasons for decision".

(c) the nature, production capabilities and timber requirements of established and proposed timber processing facilities,

Timber processing facilities

- existing mills

Timber volume harvested from the Toba Inlet portion of TFL 10 represents less than 2 percent of the licensee's total current AAC of 3.6 million cubic metres. The volume harvested from the TFL supports a number of sawmills on the Lower Mainland and represents about one-and-half month's wood supply to one of these mills, based upon the average wood requirement of these mills. Logs graded and sorted as pulp are sold or traded for sawlogs from other companies.

I am mindful of the reliance of timber processing facilities on the volume harvested in the TFL and have taken this into account in my 'Reasons for Decision'.

(d) the economic and social objectives of the government, as expressed by the minister, for the area, for the general region and for British Columbia;

Economic and social objectives

- Minister's letter and memorandum

The Minister has expressed the economic and social objectives of the Crown for the province in two documents to the chief forester—a letter dated July 28, 1994, (attached as Appendix 3) and a memorandum dated February 26, 1996, (attached as Appendix 4). These economic and social objectives are an important consideration in my determination of the AAC for TFL 10.

The letter and memorandum include objectives for forest stewardship, a stable timber supply, and a managed transition from old-growth to second-growth forests, so as to provide for community stability.

The Minister stated in his 1994 letter, that "any decreases in allowable cut at this time should be no larger than are necessary to avoid compromising long-run sustainability." He placed particular emphasis on the importance of long-term community stability and the continued availability of good forest jobs. To this end he asked that the chief forester consider the potential impacts on timber supply of commercial thinning and harvesting in previously uneconomical areas. To encourage this the Minister suggested consideration of partitioned AACs.

The Minister's 1996 memorandum addressed the effects of visual resource management on timber supply. It asked that pre-Code constraints applied to timber supply in order to meet VQOs be re-examined when determining AACs in order to ensure they do not unnecessarily restrict timber supply.

I have considered the contents of the letter and memorandum in my determination of the AAC for TFL 10. I note that commercial thinning is not occurring to any significant extent on TFL 10, and that the licensee has not indicated any plans to undertake any commercial thinning in its proposed MP No. 8. In addition, as discussed earlier under *economic and physical operability*, I am satisfied that there are no further significant opportunities at this time for harvesting in previously uneconomical areas, beyond what was incorporated into the base case assumptions.

I note that the licensee has been unable to harvest stands in the Toba River area, and that this area represents a sizeable portion of this TFL. While I am aware of the licensee's request to the Minister for a temporary AAC reduction under section 61 of the *Forest Act*; I encourage the licensee to continue discourse regarding road access with the Klahoose First Nation. As discussed under Partitioned component of the harvest, I have decided to continue with the partition to the Toba Inlet portion of the TFL.

- local objectives

The Minister's letter of July 28, 1994, suggests that the chief forester should consider important social and economic objectives that may be derived from the public input in the timber supply review where these are consistent with government's broader objectives.

The licensee indicates in its draft Management Plan No. 8 that it actively solicited input on the statement of management objectives, options and procedures (SMOOP) and the draft management plan.

I am satisfied that the licensee has carried out its public involvement obligations satisfactorily, and that no specific issues were identified in public review which would impact this determination.

First Nations

Three First Nations have identified traditional territory in the vicinity of TFL 10: the Klahoose, the Homalco, and the Kwakiutl. The licensee has committed to conduct discussions with First Nations on resource-related issues; including fisheries, wildlife, forests, water, and soils. In addition, standard Ministry of Forests consultation policies will apply to operational planning, as outlined in the Ministry of Forests Policy on Aboriginal Rights and Title, and associated Consultation Guidelines.

I encourage the licensee to continue discussions with the Klahoose First Nation regarding road access through their reserve to the Toba River portion of the TFL.

(e) abnormal infestations in and devastations of, and major salvage programs planned for, timber on the area.

Abnormal infestations and salvage

- unsalvaged losses

Numerous parasites, fungi or plants can kill trees or degrade the quality and value of logs. Unsalvaged losses are timber volumes destroyed or damaged by agents such as fire and disease, that are not recovered through salvage operations.

Estimates for unsalvaged losses account for epidemic infestations that are not incorporated into yield estimates used in the analysis. Timber volume losses due to insects and diseases that normally affect stands (endemic losses) are accounted for in inventory sampling for existing timber yield estimation or through other methods. Losses associated with second-growth stands are addressed by application of operational adjustment factors (OAFs) as noted previously in this rationale.

Empirical data on unsalvaged losses were not available for TFL 10. Therefore, an annual allowance of 0.11 cubic metres per hectare (2677 cubic metres) was deducted from all projected harvest levels. The licensee based this estimate on assumptions used in the adjacent Sunshine Coast TSA, which has similar topography and experiences similar climatic conditions. BCFS district staff believe that non-recoverable losses for TFL 10

may in fact be lower than in the TSA.

I accept that the base case estimates for unsalvaged losses represent the best available information and are appropriate for use in this determination. However, I request that the licensee work to compile information specific to the TFL that will assist in future timber supply analyses.

Reasons for Decision

I have considered the information discussed throughout this document, and I have reasoned as follows.

For the reasons stated in 'Timber Supply Analysis' and from reviewing the considerations as recorded above, I accept the licensee's base case as an adequate basis from which to assess timber supply for this AAC determination.

In determining this AAC, I have identified factors which, considered separately, indicate that the timber supply may be either greater or less than that projected in the base case. Generally some of these factors can be quantified and their impacts assessed with some reliability. Others may influence timber supply by adding an element of risk or uncertainty to the decision but cannot be reliably quantified at this time. I have accounted for these latter factors in my determination in more general terms.

In this rationale, I have identified several factors for which I believe the base case assumptions differ from current operational practices or conditions. These factors are summarized below.

For this determination, I have identified one factor that I believe will depress timber supply compared to the base case projection:

- *identified wildlife management strategy* – I concluded that the eventual establishment of WHAs and other measures to manage for identified wildlife will result in a decrease of up to one percent in timber supply in the mid- to long-term timber supply.

For this determination, there are three factors that I believe will act to increase timber supply compared to the base case projection:

- *site productivity estimates* – Based on coastal OGSI and SIBEC studies and their effect on timber supply as projected in the sensitivity analyses, I have concluded that future yields of regenerating stands and hence long-term timber supply may be significantly greater than projected in the base case projection.
- *visually sensitive areas* – The modelling method used for VQOs in the base case resulted in deciduous stands never attaining green-up height (5 metres). Allowing deciduous stands to attain green-up height in the model led to an increase of 5300 cubic metres per year in the long-term harvest level.
- *use of select seed* – I concluded that incorporating the increases in the productivity of regenerating stands due to the licensee's use of seedlings produced from select seed results in up to a 3-percent increase in the long-term timber supply.

In reaching my determination I have considered the above factors and have evaluated them on the basis of which portion of the forecast period they affect (the short, mid, or long term).

I note that none of the four factors listed above affect the short-term timber supply; therefore, I conclude that the base case provides a reasonable estimate of the short-term timber supply.

With regards to the mid- and long-term timber supply, I note that the productivity of managed stands on TFL 10 is likely higher than was assumed in the timber supply analysis. Collection of localized site productivity information has not occurred; however, the results of provincial studies have consistently indicated that the site productivity of managed stands is higher than indicated by existing old-growth stands. Furthermore, the licensee's base case did not account for the increase in the productivity of managed stands due to the use of seedlings grown from select seed.

There has also been an underestimation of 5300 cubic metres per year in the long-term timber supply due to the error in modelling visual quality objectives.

However, there is still a high degree of uncertainty regarding the impact on timber supply due to the establishment of ungulate winter range and grizzly bear habitat, which is exacerbated by the small size of the Toba Inlet portion of the TFL.

In summary, I conclude that the licensee's proposed harvest level of 170 950 cubic metres per year represents a reasonable harvest level for this TFL. In view of the lack of a road access agreement between the licensee and the Klahoose First Nation, and the risk inherent in concentrating the harvest on the Toba Inlet portion of the TFL, I will continue with a partition of 55 000 cubic metres per year to the Toba River portion of the TFL.

Determination

I have considered and reviewed all the factors documented above, including the risks and uncertainties of the information provided. It is my determination that a timber harvest level that accommodates objectives for all forest resources during the next five years, that reflects current management practices as well as the socio-economic objectives of the Crown, can best be achieved by establishing an AAC of 170 950 cubic metres, which is the same as the AAC for the most recent five-year period. Of the total AAC, 55 000 cubic metres is partitioned to the Toba Inlet portion of the TFL.

This determination is effective September 13, 2001 and will remain in effect until a new AAC is determined, which must take place within five years of the date of this determination.

If additional significant new information is made available to me, or major changes occur in the management assumptions upon which I have predicated this decision, then I am prepared to revisit this determination sooner than the five years required by legislation.

Implementation

In the period following this determination and leading to the subsequent determination, I encourage BCFS and licensee staff to undertake the tasks and studies noted below that I have also mentioned in the appropriate sections of this rationale document. I recognize that the ability to undertake these projects is dependent on the availability of staff time and funding. However, this work will be important to help reduce the risk and uncertainty associated with key factors that affect timber supply on TFL 10. I encourage the licensee to:

- provide forest cover information regarding the 328 hectares for which no such information was available for this determination;
- in conjunction with BCFS staff, obtain accurate measurements of road widths;
- work with MWLAP staff to improve the quality of the grizzly bear habitat inventory;
- collect localized site productivity information;
- provide justification for the use of increased OAF 2 values for conifers other than Douglas-fir;
- review and refine regeneration delay assumptions;
- confirm assumptions about minimum harvestable ages;
- work with MWLAP staff to clarify the areas required for ungulate winter range; and
- compile information on unsalvaged losses specific to TFL 10.

Ken Baker
Deputy Chief Forester
September 13, 2001

Appendix 1: Section 8 of the *Forest Act*

Section 8 of the *Forest Act*, Revised Statutes of British Columbia 1996, reads as follows:

Allowable annual cut

8. (1) The chief forester must determine an allowable annual cut at least once every 5 years after the date of the last determination, for

(a) the Crown land in each timber supply area, excluding tree farm licence areas, community forest areas and woodlot licence areas, and

(b) each tree farm licence area.

(2) If the minister

(a) makes an order under section 7 (b) respecting a timber supply area, or

(b) amends or enters into a tree farm licence to accomplish the result set out under section 39 (1) (a) to (d),

the chief forester must make an allowable annual cut determination under subsection (1) for the timber supply area or tree farm licence area

(c) within 5 years after the order under paragraph (a) or the amendment or entering into under paragraph (b), and

(d) after the determination under paragraph (c), at least once every 5 years after the date of the last determination.

(3) If

(a) the allowable annual cut for the tree farm licence area is reduced under section 9 (3), and

(b) the chief forester subsequently determines, under subsection (1) of this section, the allowable annual cut for the tree farm licence area,

the chief forester must determine an allowable annual cut at least once every 5 years from the date the allowable annual cut under subsection (1) of this section is effective under section 9 (6).

(4) If the allowable annual cut for the tree farm licence area is reduced under section 9 (3), the chief forester is not required to make the determination under subsection (1) of this section at the times set out in subsection (1) or (2) (c) or (d), but must make that determination within one year after the chief forester determines that the holder is in compliance with section 9 (2).

(5) In determining an allowable annual cut under subsection (1) the chief forester may specify portions of the allowable annual cut attributable to

(a) different types of timber and terrain in different parts of Crown land within a timber supply area or tree farm licence area, and

(b) different types of timber and terrain in different parts of private land within a tree farm licence area.

(c) [Repealed 1999-10-1.]

(6) The regional manager or district manager must determine an allowable annual cut for each woodlot licence area, according to the licence.

(7) The regional manager or the regional manager's designate must determine a rate of timber harvesting for each community forest agreement area, in accordance with

(a) the community forest agreement, and

(b) any directions of the chief forester.

(8) In determining an allowable annual cut under subsection (1) the chief forester, despite anything to the contrary in an agreement listed in section 12, must consider

(a) the rate of timber production that may be sustained on the area, taking into account

(i) the composition of the forest and its expected rate of growth on the area,

(ii) the expected time that it will take the forest to become re-established on the area following denudation,

(iii) silviculture treatments to be applied to the area,

(iv) the standard of timber utilization and the allowance for decay, waste and breakage expected to be applied with respect to timber harvesting on the area,

(v) the constraints on the amount of timber produced from the area that reasonably can be expected by use of the area for purposes other than timber production, and

(vi) any other information that, in the chief forester's opinion, relates to the capability of the area to produce timber,

(b) the short and long term implications to British Columbia of alternative rates of timber harvesting from the area,

(c) the nature, production capabilities and timber requirements of established and proposed timber processing facilities,

(d) the economic and social objectives of the government, as expressed by the minister, for the area, for the general region and for British Columbia, and

(e) abnormal infestations in and devastations of, and major salvage programs planned for, timber on the area.

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Appendix 2: Section 4 of the *Ministry of Forests Act*

Section 4 of the *Ministry of Forests Act* (consolidated 1988) reads as follows:

Purposes and functions of ministry

4. The purposes and functions of the ministry are, under the direction of the minister, to

(a) encourage maximum productivity of the forest and range resources in British Columbia;

(b) manage, protect and conserve the forest and range resources of the government, having regard to the immediate and long term economic and social benefits they may confer on British Columbia;

(c) plan the use of the forest and range resources of the government, so that the production of timber and forage, the harvesting of timber, the grazing of livestock and the realization of fisheries, wildlife, water, outdoor recreation and other natural resource values are coordinated and integrated, in consultation and cooperation with other ministries and agencies of the government and with the private sector;

(d) encourage a vigorous, efficient and world competitive timber processing industry in British Columbia; and

(e) assert the financial interest of the government in its forest and range resources in a systematic and equitable manner.

Documents attached:

Appendix 3: Minister of Forests' letter of July 28, 1994

Appendix 4: Minister of Forests' memo of February 26, 1996

File: 10100-01

JUL 28 1994

John Cuthbert
Chief Forester
Ministry of Forests
595 Pandora Avenue
Victoria, British Columbia
V8W 3E7

Dear John Cuthbert:

Re: Economic and Social Objectives of the Crown

The *Forest Act* gives you the clear responsibility for determining Allowable Annual Cuts, decisions with far-reaching implications for the province's economy. The *Forest Act* provides that you consider the social and economic objectives of the Crown, as expressed by me, in making these determinations. The purpose of this letter is to provide this information to you.

The social and economic objectives expressed below should be considered in conjunction with environmental considerations as reflected in the Forest Practices Code, which requires recognition and better protection of non-timber values such as biodiversity, wildlife and water quality.

The government's general social and economic objectives for the forest sector are made clear in the goals of the Forest Renewal Program. In relation to the Allowable Annual Cut determinations you must make, I would emphasize the particular importance the government attaches to the continued availability of good forest jobs and to the long-term stability of communities that rely on forests.

Through the Forest Renewal Plan, the government is taking the steps necessary to facilitate the transition to more value-based management in the forest and the forest sector. We feel that adjustment costs should be minimized wherever possible, and to this end, any decreases in allowable cut at this time should be no larger than are necessary to avoid compromising long-run sustainability.

.../2

Province of
British Columbia

Minister of
Forests

Parliament Buildings
Victoria, British Columbia
V8V 1X4

In addition to the provincial perspective, you should also consider important local social and economic objectives that may be derived from the public input on the Timber Supply Review discussion papers where these are consistent with the government's broader objectives.

Finally, I would note that improving economic conditions may make it possible to harvest timber which has typically not been used in the past. For example, use of wood from commercial thinnings and previously uneconomic areas may assist in maintaining harvests without violating forest practices constraints. I urge you to consider all available vehicles, such as partitioned cuts, which could provide the forest industry with the opportunity and incentive to demonstrate their ability to utilize such timber resources.

Yours truly,

Andrew Petter
Minister

Province of British Columbia
Ministry of Forests
OFFICE OF THE MINISTER

MEMORANDUM

File: 16290-01

February 26, 1996

To: Larry Pedersen
Chief Forester

From: The Honourable Andrew Petter
Minister of Forests

Re: **The Crown's Economic And Social Objectives Regarding Visual Resources**

Further to my letter of July 29, 1994, to your predecessor, wherein I expressed the economic and social objectives of the Crown in accordance with Section 7 of the *Forest Act*, I would like to elaborate upon these objectives as they relate to visual resources.

British Columbia's scenic landscapes are a part of its heritage and a resource base underlying much of its tourism industry. They also provide timber supplies that are of significant economic and social importance to forest industry dependent communities.

Accordingly, one of the Crown's objectives is to ensure an appropriate balance within timber supply areas and tree farm licence areas between protecting visual resources and minimizing the impact of such protection measures on timber supplies.

As you know, I have directed that the policy on management of scenic landscapes should be modified in light of the beneficial effects of the Forest Practices Code. In general, the new policy should ensure that establishment and administration of visual quality objectives is less restrictive on timber harvesting. This change is possible because alternative harvesting approaches as well as overall improvement in forest practices will result in reduced detrimental impacts on visually sensitive areas. Also, I anticipate that the Forest Practices Code will lead to a greater public awareness that forest harvesting is being conducted in a responsible, environmentally sound manner, and therefore to a decreased public reaction to its visible effects on the landscape. In relation to the Allowable Annual Cuts determinations that you make, please consider the effects that the new policy will have in each Timber Supply Area and Tree Farm Licence.

.../2

In keeping with my earlier letter, I would re-emphasize the Crown's objectives to ensure community stability and minimize adjustment costs as the forest sector moves to more value-based management. I believe that the appropriate balance between timber and visual resources will be achieved if decisions are made consistent with the ministry's February 1996 report *The Forest Practices Code: Timber Supply Analysis*.

Finally, in my previous letter I had asked that local economic and social objectives be considered. Please ensure that local views on the balance between timber and visual resources are taken into account within the context of government's broader objectives.

Andrew Petter
Minister of Forests